

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (previously presented) A statistical multiplex transmission system for use in a network which includes a first local area asynchronous transfer mode (ATM) network including a plurality of first terminal devices, a second local area ATM network including a plurality of second terminal devices, and a public ATM network connected to said first and second ATM networks, comprising:

a first multiplex gateway device for connecting said first local area ATM network and said public ATM network;

a second multiplex gateway device for connecting said second local area ATM network and said public ATM network,

wherein said first and second multiplex gateway devices are configured to:

receive ATM transmission signals from said first and second local area ATM networks, respectively,

perform a statistical multiplexing process to determine statistical information based on a mean rate and a peak cell rate associated with said ATM transmission signals and generate transmission statistical multiplex signals based on the statistical information, and

transmit said transmission statistical multiplex signals to said public ATM network.

2. (previously presented) The statistical multiplex transmission system as claimed in claim 1, wherein said first and second multiplex gateway devices are configured to transmit said transmission statistical multiplex signals by a piece-wise constant bit rate transmission system including a transmission rate which varies in a predetermined time interval after the statistical multiplexing process.

3. (previously presented) The statistical multiplex transmission system as claimed in claim 1, wherein said first and second multiplex gateway devices are configured to:
receive said transmission statistical multiplex signals,
separate said transmission statistical multiplex signals, and
generate a plurality of receiving ATM signals, and
wherein said first and second multiplex gateway devices are configured to transmit said receiving ATM signals to said first and second terminal devices through said first and second local area ATM networks, respectively.

4. (previously presented) The statistical multiplex transmission system as claimed in claim 3, wherein said first and second multiplex gateway devices comprise:
first means for calculating the statistical information represented by a mean rate and a peak cell rate of ATM cells in said ATM transmission signals; and
second means for performing a multiplexing process on said ATM cells according to said statistical information, and for transmitting said transmission statistical multiplex signals to said public ATM network.

5. (previously presented) The statistical multiplex transmission system as claimed in claim 4, wherein said second means includes:

third means for conducting rate addition after the multiplexing process according to said statistical information and for determining a rate addition result;

fourth means for calculating a required piece-wise constant bit rate on the basis of said rate addition result, and for performing cell multiplex control on the basis of said piece-wise constant bit rate; and

fifth means for transmitting said transmission statistical multiplex signal according to said cell multiplex control.

6. (previously presented) The statistical multiplex transmission system as claimed in claim 5, wherein said fifth means receives said transmission statistical multiplex signal to separate said transmission statistical multiplex signal, and
generates a receiving ATM signal.

7. (previously presented) The system of claim 1, further comprising:
a control unit operably connected to said first multiplex gateway device,
wherein the control unit re-negotiates a transmission rate of said transmission statistical multiplex signals after said statistical multiplexing process, in a predetermined time interval, through adaptive control of parameters acquired from the ATM transmission signals.

8. (previously presented) The system of claim 1, wherein the plurality of first and second terminal devices are International Telecommunications Union (ITU) recommendation H.310 compliant.

9. (previously presented) The system of claim 1, further comprising:
a statistical multiplexing control unit, operably connected to one of the first or second multiplex gateway device, for performing a rate addition after said statistical multiplexing process according to statistical information from said ATM transmission signals.

10. (previously presented) The system of claim 9, further comprising:
a piece-wise constant bit rate control unit, operably connected to the statistical multiplexing control unit, for receiving the rate addition calculation from said statistical multiplexing control unit, and
calculating a piece-wise constant bit rate for transmission of said transmission statistical multiplex signals to said public ATM network.

11. (previously presented) The system of claim 9, further comprising:
an ATM transmission line unit, operably connected to the statistical multiplexing control unit, for calculating the statistical information from ATM cells in said ATM transmission signals, and
transmitting the statistical information and the ATM cells to an ATM cell multiplexing/demultiplexing unit.

12. (previously presented) The system of claim 11, wherein the ATM cell multiplexing/demultiplexing unit is operably connected to one of the first or second multiplex gateway device, and performs cell multiplexing control on the basis of the piece-wise constant bit rate, and

wherein the ATM cell multiplexing/demultiplexing unit transmits the transmission statistical multiplex signals to the statistical multiplexing control unit.

13. (currently amended) A statistical multiplex transmission system for use in a network that includes a first local area Asynchronous Transfer Mode (ATM) network including a plurality of first terminal devices, a second local area ATM network including a plurality of second terminal devices, and a public ATM network connected to said first and second ATM networks, the system comprising:

a first multiplex gateway device for connecting said first local area ATM network and said public ATM network;

a second multiplex gateway device for connecting said second local area ATM network and said public ATM network,

wherein said first and second multiplex gateway devices are configured to:

receive ATM transmission signals from said first and second local area ATM networks, respectively,

perform a statistical multiplexing process to determine statistical information based on ~~at least one of~~ a mean rate [[or]] and a peak cell rate associated with said ATM

transmission signals and generate statistical multiplex transmission signals based on the statistical information, and

transmit said statistical multiplex transmission signals to said public ATM network based on a piece-wise constant bit rate that varies in a predetermined time interval.

14. (previously presented) The system of claim 13, further comprising:
a control unit, operably connected to said first multiplex gateway device,
wherein the control unit re-negotiates a transmission rate of said statistical multiplex transmission signals after said statistical multiplexing process, in a predetermined time interval, through adaptive control of parameters acquired from the ATM transmission signals.

15. (previously presented) The system of claim 13, wherein the plurality of first and second terminal devices are International Telecommunications Union (ITU) recommendation H.310 compliant.

16. (previously presented) The system of claim 13, further comprising:
a statistical multiplexing control unit, operably connected to the first or second multiplex gateway device, for performing a rate addition after said statistical multiplexing process according to statistical information from said ATM transmission signals.

17. (previously presented) The system of claim 16, further comprising:

a piece-wise constant bit rate control unit, operably connected to the statistical multiplexing control unit, for receiving a result of the rate addition from said statistical multiplexing control unit and calculating a piece-wise constant bit rate for transmission of said statistical multiplex transmission signals to said public ATM network based on the result of the rate addition.

18. (previously presented) The system of claim 16, further comprising:
an ATM transmission line unit, operably connected to the statistical multiplexing control unit, for calculating statistical information of ATM cells in said ATM transmission signals, and transmitting the statistical information and the ATM cells to an ATM cell multiplexing/demultiplexing unit.

19. (previously presented) The system of claim 18, wherein the ATM cell multiplexing/demultiplexing unit is operably connected to one of said first or second multiplex gateway device, and performs cell multiplexing control on the basis of the piece-wise constant bit rate, and

wherein the ATM cell multiplexing/demultiplexing unit transmits the statistical multiplex transmission signals to the statistical multiplexing control unit.

20. (currently amended) A method for statistical multiplex data transmission in an asynchronous transfer mode (ATM) network including a first local area ATM network connected to a plurality of first terminal devices, a second local area ATM network connected to a plurality

of second terminal devices, and a public ATM network connected to said first and second ATM networks, the method comprising:

connecting a first multiplex gateway device to said first local area ATM network and said public ATM network;

connecting a second multiplex gateway device to said second local area ATM network and said public ATM network;

receiving ATM transmission signals from said first and second local area ATM networks into said first and second multiplex gateway devices, respectively;

performing a statistical multiplexing process to determine statistical information based on ~~at least one of~~ a mean rate ~~[[or]]~~ and a peak cell rate associated with said ATM transmission signals and generate transmission statistical multiplex signals based on the statistical information; and

transmitting said transmission statistical multiplex signals to said public ATM network based on a piece-wise constant bit rate that varies in a predetermined time interval after the statistical multiplexing process.

21. (previously presented) The method of claim 20, further comprising:
performing a rate addition after said statistical multiplexing process according to statistical information from said ATM transmission signals.

22. (previously presented) The method of claim 21, further comprising:
receiving a result of the rate addition; and

calculating a piece-wise constant bit rate for transmission of said transmission statistical multiplex signals to said public ATM network based on the result of the rate addition.

23. (previously presented) The method of claim 22, further comprising:
calculating statistical information of ATM cells in said ATM transmission signals, and
transmitting the statistical information and the ATM cells to an ATM cell multiplexing/demultiplexing unit.

24. (previously presented) The method of claim 23, further comprising:
performing cell multiplexing control on the basis of the piece-wise constant bit rate.

25. (new) A statistical multiplexing device, comprising:
a plurality of ATM transmission line units to:
 receive ATM transmission signals, and
 perform a statistical multiplexing process to determine statistical information
based on a mean rate and a peak cell rate associated with the ATM transmission signals;
a control unit to determine a piece-wise constant bit rate based on the statistical
information; and
an ATM multiplexing/demultiplexing unit to:
 generate statistical multiplex signals based on the piece-wise constant bit rate, and
 transmit the statistical multiplex signals to a public ATM network.

26. (new) A statistical multiplexing method performed by a network device, comprising:
- receiving ATM transmission signals;
 - performing a statistical multiplexing process to determine statistical information based on a mean rate and a peak cell rate associated with the ATM transmission signals;
 - determining a piece-wise constant bit rate based on the statistical information;
 - generating statistical multiplex signals based on the piece-wise constant bit rate; and
 - transmitting the statistical multiplex signals to a public ATM network.